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Report on

Dollar Impact of Financial Management Decisions in the Uranium Enrichment Program

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U. S. DEPARTMENT OF ENERGY

OFFICE OF INSPECTOR GENERAL

REPORT ON

DOLLAR IMPACT OF FINANCIAL MANAGEMENT DECISIONS IN THE URANIUM ENRICHMENT PROGRAM

Report No: DOE/IG-0186
Date of Issue: August 13, 1982

Washington Audit Office
Germantown, Maryland 20545

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SUMMARY

This report discusses several financial management decisions made by departmental officials, and the effect of those decisions on uranium enrichment operations. The most important of these was a 1978 decision, implemented in 1979, that allowed some customers to defer acceptance and payment for enrichment services totaling $3.5 billion during Fiscal Years 1980 through 1984. Schedule adjustment charges, designed to recover the Government's interest costs associated with the deferrals, we believe, should have been $909 million. Departmental officials, however, collected only $154 million--$755 million less than we calculated should have been collected from these customers under the method chosen to compute the charges. Although the $755 million will eventually be collected through higher rates to customers, these undercollections will, however, result in the Government bearing an additional $270 million of interest costs over a ten-year period.

Beginning in 1974, many utilities found themselves contractually overcommitted to buying enrichment services and repeatedly sought relief in the form of deferred delivery schedules. In designing a more attractive contract in 1978, Department of Energy (DOE) officials recognized the need for adjustments to a more orderly delivery schedule. They also recognized that the resulting deferred revenues would cause additional costs to the Government, and they provided for schedule adjustment charges to the customers

involved to recover those costs. In 1979, however, when calculating the charges to existing customers, the Department (1) used an interest rate well below the Government's borrowing cost at the time; (2) used old prices that were lower than those then in effect; (3) applied the interest only to the first of several years' deferrals; and (4) calculated the charges as though they would be collected 27 months earlier than they actually would be collected. Because of the large amount of revenues involved, these lower cost factors resulted in schedule adjustment charges that were considerably less than we believe warranted under the legislative mandate of full-cost recovery.

If the $755 million had been paid into the Treasury, it could have been used to offset costs associated with deferred enriched uranium deliveries--the costs of unused plant and equipment, unused electrical power, and the cost of financing unsold inventories and plant expansion. Departmental officials were aware that they were not charging the full amount of interest due, but had not calculated the amount of the undercharge. They stated that certain policy objectives, at that time, outweighed the financial considerations.

In the short-term, some of these funds will have to be made up through increased Treasury borrowing at current high interest rates. Further, since the Atomic Energy Act requires full-cost recovery, enrichment prices for all customers will have to be

raised to effect recovery of these funds over the long term. Accordingly, the $755 million represents an undercharge to some customers at the expense of other customers and the Government.

This report also discusses the deferrals of delinquent accounts receivable, at favorable interest rates, granted to customers who claimed inability to pay. The financial status of those customers, however, was not verified, as we believe it should have been, prior to granting the deferrals. We estimate the deferrals resulted in additional interest costs to the Government of $951,000.

When customers elect to defer enrichment services, they pay charges for all years in which deferrals take place. However, the interest rate used in computing the charges was below the Government's current average borrowing costs (the current-value-of-funds rate) and so the U.S. Treasury's actual interest expense will not be fully recovered.

Finally, the report discusses the payment terms provided in uranium enrichment contracts that allow customers 30 days from the billing date to make payment. We estimated that the carrying charges on the 30-day payment terms (which most customers take full advantage of) amounted to about $12.5 million annually. Since uranium enrichment services involve large shipments,

typically costing in the millions of dollars, it seems to us questionable to provide 30-day payment terms, especially in light of current high interest rates.

The decisions discussed in the report all focus on the financing costs of deferred revenues that are borne by the Treasury rather than DOE. The report concludes that there is a need for Department managers to pay greater attention to the financial impact of their decisions because of the significant interest costs involved. This report recommends, specifically, that: (1) adequate consideration be given to the time value of money (i.e., interest cost or income) when making financial decisions; (2) use of the current-value-of-funds rate be considered in computing future schedule adjustment charges; and (3) consideration be given to reducing the customers' period of payment in future contracts.

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INTRODUCTION

Objective and Scope

Our review of selected cash management policies, practices, and procedures of the uranium enrichment activity within the DOE is part of a broader, ongoing examination of the Department's cash management practices and procedures, including debt collection. The overall objective is to evaluate the Department's effectiveness in managing its cash resources.

This is the fifth report issued on the subject; the other reports being (1) "Excessive Interest Costs of Letter-of-Credit Accounts" (DOE/IG-0152) dated April 6, 1981; (2) "Report on Low Interest Rates Charged on Delinquent Accounts Receivable" (DOE/IG-0163) dated June 24, 1981; (3) "Need to Make the Natural Gas Pipeline Certificate Program as Financially Self-Sustaining as Possible" (DOE/IG-0176) dated November 4, 1981; and (4) "Assessment of Charges Under the Hydropower Licensing Program" (DOE/IG-0178) dated December 22, 1981.

This review included visits to the Oak Ridge Operations Office, Oak Ridge, Tennessee, and discussions with officials in the DOE Controller's Office, the Office of Management and Budget, the Treasury Department, the Federal Reserve Board, and with commercial loan officers. We reviewed accounts receivable data, contract files, correspondence, and other pertinent

information related to the cash management and debt collection policies, practices, and procedures of the uranium enrichment activity. The review was made in accordance with generally accepted Government auditing standards and, accordingly, included such tests and auditing procedures as were considered necessary in the circumstances.

Background

During Fiscal Year 1980, the U.S. Government received more than $1.2 billion from uranium enrichment activities, making it one of the largest revenue-producing activities managed by the DOE. Revenues are expected to increase substantially in future years.

Generally, the enrichment process consists of increasing the percentage of fissionable material (U-235) in uranium so that it can be used as fuel in reactors to generate electricity, or for defense purposes. The process is costly. Capital investment and electrical costs constitute much of the expense. For this reason, among others, there are only four other uranium enrichment entities worldwide, all government controlled. In the United States, enrichment services are provided exclusively by the DOE through a private contractor.

The uranium enrichment operation is appropriated the amount of its annual estimated revenues and permitted to obligate them in advance of collection. Customers, foreign and domestic,

provide the uranium and are charged based on the amount of processing required to enrich it to specified levels.

Enrichment service pricing is based on full cost recovery over a reasonable period, as required by the Atomic Energy Act of 1954. The law's intent is for the Government to break even on the services provided commercial customers.

Day-to-day management of the Department's uranium enrichment activity is provided by the Oak Ridge Operations Office through a private contractor. The Office of the Assistant Secretary for Nuclear Energy is responsible for overall policy and management of this activity.

Uranium enrichment services have been provided to commercial utility companies (customers) since the mid-1950's. Until 1964, customers were prohibited by law from owning the enriched uranium, which they leased. With passage of the Private Ownership Act in 1964, customers were allowed to own the material. Beginning in 1969 the Atomic Energy Commission (AEC) (which then managed the program) discontinued the leasing program and entered into "requirements" contracts with customers. These contracts called for delivery schedules, but customers were not obligated to take the deliveries specified, even though the Government was committed to filling orders on 180 days'

notice. Therefore, the Government was in the difficult position of having to meet both short-term and long-term demands without any assurance as to what the demand would be. To correct this situation, the AEC developed a long-term, fixed-commitment contract that had to be executed eight years prior to beginning deliveries; required a firm ten-year delivery schedule; and provided for an advance payment. This contract provided the AEC with a firmer basis for planning production levels and construction requirements. Customers with requirements contracts elected to retain them because of the greater flexibility, but all new customers were required to sign the new fixed-commitment contracts.

The first long-term, fixed-commitment contract was signed in September 1973. At that time, prospects for nuclear power were good. The Atomic Energy Commission quickly signed many new customers but was unable to sign all customers desiring enrichment services because of limited production capacity. Based on these committed revenues from new contracts, the AEC began expanding production capacity and entered into long-term agreements with the Tennessee Valley Authority and other electrical power suppliers for the vast amounts of electricity needed for enriching uranium. Since these suppliers had to expand their generating capacity to meet AEC power requirements, the contracts provided for minimum demand charges that had to be paid whether or not the AEC used the power.

Soon after the contracts were signed, nuclear development slowed for economic reasons, such as reduced consumer demand for electricity and later because of public opposition to new nuclear power plants. Enrichment customers began encountering delays in completing planned reactors, and some began reevaluating whether or not to build additional reactors. As a result, some customers found themselves overcommitted to buying enrichment services.

In 1975, officials of the Energy Research and Development Administration (ERDA), the successor agency of the AEC and predecessor to the DOE, decided it would be mutually advantageous to grant contractual relief to customers who found themselves overcommitted to buying enrichment services. Through use of an "open season," customers were allowed, at no cost, to terminate their contracts or adjust delivery schedules. While a few customers terminated, most chose merely to delay their scheduled deliveries.

After the "open season," continuing delays in reactor construction and still lessening consumer demand for electricity made even more of the adjusted delivery schedules optimistic. Even though most long-term, fixed-commitment customers had taken advantage of the 1975 "open season" offer, many were again seeking contractual relief within two years.

In April 1977, the Administration announced that ERDA officials would begin taking new orders for enrichment services, which they had been unable to do in the past for lack of capacity. Simultaneously, ERDA announced that it would consider granting new relief to existing customers.

By 1978, DOE officials had decided that the long-term, fixed-commitment contracts were too rigid to attract new customers, especially those foreign customers being sought in furtherance of the Administration's nuclear nonproliferation objectives. They believed contracts were needed that would allow for orderly adjustments of delivery schedules, similar to provisions offered by foreign enrichment competitors. They therefore developed an adjustable, fixed-commitment contract that would allow customers to adjust deliveries upon payment of a "schedule adjustment charge." These charges were designed to recover the Government's costs of delayed revenue receipts from those customers who had slipped the delivery schedules. Subsequently, officials decided also to grant existing customers financial relief from their contracts by allowing them to convert to the new adjustable, fixed-commitment contracts.

While the new contract terms, implemented in 1979, did not attract any new customers because of diminished worldwide demand, over 80 percent of the existing long-term, fixed-commitment contract customers did convert.

FINDINGS

1. Full Costs of Schedule Adjustments Not Adequately Considered in Granting Contractual Relief

In 1979, long-term, fixed-commitment customers were granted contractual relief allowing them to defer receiving and paying for uranium enrichment services totaling about $3.5 billion. While departmental officials recognized that there would be financing costs associated with these revenue deferrals, they reduced the factors used in computing the scheduled adjustment charges that were designed to recover those costs. This was done primarily for policy, rather than financial considerations. We estimate the impact of this reduction to be an undercollection of $755 million. The Atomic Energy Act requires full cost recovery; therefore, the $755 million will be recovered over a ten-year period by charging higher prices to all customers. Because the interest rates charged to customers are less than those paid by Treasury, however, we estimate that unrecovered interest costs to the Government will be about $270 million over the ten-year period.

Forty-three customers elected to convert 85 long-term fixed-commitment contracts to adjustable, fixed-commitment contracts.[1/]

1/ Our review was limited to contracts that had adjusted delivery schedules for Fiscal Years 1980 through 1984. There were several other contracts that had deferred deliveries originally scheduled after 1984.

The reduced schedule adjustment charges allowed these customers to avoid $755 million in additional charges. Individually, the customers avoided charges ranging from about $38,000 to $120 million. The customers included 13 foreign customers that avoided charges of about $247 million. (See Appendix A.)

Additional incentives were provided customers by revising various factors used to compute schedule adjustment charges (See Appendix B for schedule adjustment charge methodology).[1/] The factors that changed were as follows:

-- The charges were computed only on the first year of deliveries deferred rather than on all years in which deliveries were deferred.

-- An obsolete unit price of $74.85 was used rather than the then current price of $98.95, and the price was not escalated to reflect projected higher prices on sales being deferred to future years.

-- The Government's cost of money was computed at 6.403 percent, well below the actual cost of money at the time (11.30 percent).

1/ Actually, two methods were used depending on whether or not the customer had a construction permit at the time it elected to reschedule deliveries. The second method (for customers without a construction permit) limits the schedule adjustment charge to a percentage of the advance payment made at the time the contract was signed. Since the latter affected only a small portion of the $755 million, this method is not discussed in this report.

-- The charges were calculated as if they would be collected 27 months prior to the time of actual collection. The interest formula is based on discounting future interest costs to allow for the increased value of paying the charges in advance. The earlier the charges are paid, therefore, the less they will be. In this case the charges were calculated based on a payment date of July 1, 1978, even though they were not actually collected until September 30, 1980.

According to departmental officials, the formula factors were changed to give customers added inducement to convert to the new contract. Overall, the Government collected $154 million on the contract conversions--$755 million less than we estimate would have been recovered if the interest formula had been strictly applied.

Since the enrichment activity had planned its capacity to meet the higher, pre-deferral production levels, it will have certain sunk costs such as commitments for unused electricity, unused plant capacity, and increased inventories that will not be covered by incoming revenues until subsequent years.

Inadequate Financial Analysis of Relief Costs

Initially, DOE officials favored granting contractual relief to fixed-commitment customers without any charge, as was done during the 1975 open season. Former Secretary of Energy James R. Schlesinger, however, insisted that customers be charged for adjusting deliveries. DOE then considered two primary methods of charging customers for terminating or deferring contractual deliveries. Under one method, the customers would have had to pay the full costs of the schedule adjustment for all years of deferrals. Under the method actually used, however, customers were charged only for the initial year of the deferrals.

The Department's records indicated very little of the financial analysis that one would expect under the circumstances, such as the impact on customers if relief were not granted, or the costs to the Government associated with each relief method considered. Departmental officials told us they did not evaluate the financial effects of the relief options being considered or document the impact on customers if relief were not granted. They said their primary considerations at the time were nonfinancial policy objectives such as establishing realistic demand levels for the future, and furthering the President's nuclear nonproliferation policies. Although the method chosen received the required approval from the Office of Management and Budget (OMB), there was little cost data submitted for review except that related to the short-term budget impact.

Contract relief can result in significant costs to the Government. According to the Department's Uranium Enrichment Services Activity (UESA) Pricing Policy, the $755 million in schedule adjustment charge undercollections, plus interest at the average-marketable-securities rate, will be recovered over a ten-year period. We estimate that these undercollections will result in additional interest costs of $270 million to the Government over that ten-year period. The estimate assumes an even payback of $75.5 million a year during the ten-year period and uses a difference of 3.1 percent between the average-marketable-securities rate used by UESA and the current-value-of-funds rate used by the U.S. Treasury. (See APPENDIX C.)

2. Interest Rates on Deferred Receivables Did Not Cover the Government's Costs

Departmental officials have allowed some customers to defer paying accounts receivable resulting in additional costs to the Government. As with the schedule adjustment charges, insufficient attention was given to the financial need for these deferrals and the associated Government costs.

We identified and reviewed four cases where departmental officials authorized customers to delay paying monies due for uranium enrichment services. Although the official Department rate of 12 percent was charged on the delinquent accounts, the rate was well below commercial rates in effect, and therefore provided little incentive for customers to settle the accounts. The deferrals resulted in additional interest costs of $951,176 to the U.S. Treasury, as shown in the chart below:

ADDITIONAL BORROWING COSTS
TO U.S. GOVERNMENT
AS OF 4/30/81

Customer	Interest Charged On Deferral (%)	Current-Value-of-Funds Rate (%) 1/	Difference in Interest	Cost to Government
A	12	12.77	.77	$170,823
B	0	10.78	10.78	273,485
C	12	13.35 - 13.67	1.35 - 1.67	302,651
D	12	13.05	1.05	204,217
				$951,176

1/ This is a quarterly average of the U.S. Treasury tax-and-loan rate, the rate paid by commercial banks on Government deposits. As such it represents the interest value of current Treasury funds.

Departmental officials told us they generally relied on customers' statements that deferrals were needed, and the deferrals were granted without independent analyses, or consideration of the Treasury's interest costs.

The documentation related to customer A, a foreign utility, indicated that the customer requested and received a deferral, pending negotiation for a loan. Treasury and State Department officials later informed DOE officials, however, that the company was capable of paying, but probably deferred payment because of the favorable interest rate on the delinquent debt.

Customer B, a domestic company, requested payment deferral pending receipt of an export license for its enriched uranium. The customer was planning to have the enriched uranium further processed overseas for later use in the United States. The order was for highly enriched uranium, near the grade that could be used in weapons. Departmental officials granted an interest-free deferral until an export license could be obtained, and declared that constructive delivery of the materials had been made in accordance with the terms of the contract, i.e. although the material physically remained in the Government's custody pending receipt of the license, title passed to the customer and payment was due at that point.

Subsequently, the customer was denied the export license and, more importantly, the reactor for which the fuel was intended was never built. When requested to make payment, the customer maintained that it had not taken actual delivery of the materials and therefore owed nothing. Eventually, departmental officials reluctantly accepted that position since they had alternate uses for the material, which had increased in value. The primary consideration here is that payments due under the contract were deferred, interest-free, for more than a year, and eventually resulted in default by the customer. In this case the customer was erroneously treated as a foreign customer, for which the export license is generally a precondition of the sale.

Customer C, a domestic utility that operated the Three Mile Island nuclear facility, requested deferral of several payments because the Three Mile Island accident had jeopardized its financial position. Oak Ridge officials readily agreed to these deferrals, which at the time of our review totaled about $32 million. Concerned about DOE's interest as a major unsecured creditor, departmental officials told us they had not wanted to do anything that might jeopardize the customer's position. The customer's financial position, however, was not verified prior to granting the deferrals. Thus, it was not determined, prior to making the decision, if deferrals were in the Government's best interest. A year and a half later, in response to a

request for a second deferral, DOE did analyze the company's financial position before granting that deferral.

In the case of Customer D, a domestic company, the documentation revealed little, other than that a deferral was requested because the customer was reportedly experiencing cash flow problems. The deferral was granted without any analysis or verification.

While these four customers benefited from the deferrals, the Treasury incurred additional costs since its interest rates were higher than those charged to the customers.

3. Interest Rates Used in Future Schedule Adjustments Still Too Low

Although customers who elect to defer enrichment services in the future will have to pay charges for all years in which deferrals take place, the interest rate called for in the contracts on such schedule adjustments is still below the Government's current borrowing cost and so will not fully cover these costs.

The rate used under the contracts for schedule adjustment charges is the Treasury's average-marketable-securities rate. That rate is computed on a monthly basis as the weighted average of all marketable issues of Treasury bills, notes, and bonds outstanding during the month, from which a yearly average rate is derived and used by the uranium enrichment activity as the Government's cost of money. Treasury and OMB officials told us, however, that the Government's cost of money associated with deferred revenues is represented by the current-value-of-funds rate, which is the average return the Treasury receives from deposits in Treasury tax and loan accounts. Since schedule adjustment charges are intended to cover such deferred revenues, the current-value-of-funds rate, according to Treasury officials and in our judgment, is the appropriate one to use in calculating those charges.

At present, the current-value-of-funds rate is higher than the average-marketable-securities rate (a difference that

was made greater in the case of the schedule adjustment charges previously discussed because the marketable securities rate used was not even the then current rate). Of the $755 million not collected in schedule adjustment charges, $90 million was attributable to using the average-marketable-securities rate rather than the current-value-of-funds rate. Further, since the cost of using the low interest rate is borne by Treasury rather than the uranium enrichment activity, it is one cost element that will not be recovered through the normal pricing formula. 1/

1/ In a current review of uranium enrichment pricing, we are examining imputed interest on the Government's investment, including capitalization of interest charges.

4. Thirty-day Payment Terms in Existing Uranium Enrichment Contracts Result in Carrying Costs to the Government

Under the standard contract terms for uranium enrichment services, customers have 30 days from the billing date to make payment (60 days in the case of a few foreign customers)--terms that customers generally take full advantage of. We estimate that on the uranium enrichment sales of $1.2 billion in Fiscal Year 1980 at the interest rate then in effect, each day in the 30-day billing cycle, costs the Government about $417,000. Therefore, if the 30-day payment terms were reduced to cash terms, the Government could save about $12.5 million annually (30 x $417,000).

Departmental officials said they considered 30-day terms to be customary business practice and that 60 days were required for some foreign customers due to delays in international mails. They added that, at any rate, they were bound by the payment terms in existing contracts.

While 30-day terms might be common trade practice in some businesses such as retailing, we question whether they are appropriate for transactions of this magnitude, which typically run into the millions of dollars. With interest rates at their current high level, the trend is toward shorter payment periods, as most businesses are becoming increasingly aware of the time value of money.

Similarly, domestic and foreign banks are increasing the use of electronic fund transfers to move monies from bank-to-bank. Although DOE must observe existing contract terms, consideration should be given to a reduced payment period in new contracts.

CONCLUSIONS AND RECOMMENDATIONS

The financial decisions discussed in this report all point to the need for more management attention to the time value of money and its effect on costs. In the case of the schedule adjustment charges, there was an apparent desire by departmental officials to grant customers financial relief in addition to that provided by the schedule adjustments themselves. But the decision was made with little analysis of how much financial relief, if any, was necessary or appropriate under the circumstances and departmental officials never determined the extent of that relief, which we estimated at $755 million. Yet, this was cash properly due to the uranium enrichment activity that will have to be temporarily covered by Treasury funds, and through higher rates charged to existing and future customers. Similarly, decisions to allow the deferral of payments on delinquent receivables were made without adequate attention to the financial need for the deferrals and the associated costs to the Government.

Likewise, the decisions to use low interest rates in calculating schedule adjustment charges and to grant 30-day payment terms in the enrichment contracts show inadequate attention to the interest costs involved. DOE management should more fully consider the financial implications and costs of their uranium enrichment decisions before they are made.

Accordingly, we recommend that the Assistant Secretary for Nuclear Energy:

1. Make sure that adequate consideration is given to the need for and the Government's costs of deferring revenues, such as future schedule adjustments and late payment of receivables. Such considerations should require that all costs associated with the deferred revenues be documented and included in the decision packages provided to decisionmakers.

2. Consider using the current-value-of-funds rate rather than the average-marketable-securities rate in computing future schedule adjustment charges.

3. Consider reducing the 30-day customer payment period in future uranium enrichment contracts.

DEPARTMENTAL COMMENTS AND CORRECTIVE ACTIONS

The Assistant Secretary for Nuclear Energy furnished us comments on a draft version of this report which included the views of the Oak Ridge Operations staff. Although they concurred in our first recommendation, they disagreed with our other two and expressed some major disagreements with the matters of fact associated with the first finding.

They stated that they were aware of the importance of the Government's interest costs (now their second largest cost element) to the commercial success of the operation; and that they do regularly consider that cost in decisionmaking. They acknowledged that the financial analysis prepared in 1978 on the contractual relief decision was not adequately documented and was heavily weighed to consider the near-term budget impact. They stated, however, that the decision was made in support of U.S. Government policy regarding nuclear energy, and that the financial ramifications were considered to be secondary. We are not questioning in this report, however, the importance of the policy considerations, the deferral decision or the decision to assess charges. Our point is that because of the large dollar impact, decisions of this type deserve more financial analysis in the Department than they received in this instance.

Regarding the costs of unused electricity resulting from deferrals, the staff comments pointed out that if the deferrals had not been

granted, the activity would have incurred an additional $2.2 billion in electrical charges during the period. This may be true but, of course, they would also have had the sales and revenues of about $3.5 billion to cover those costs.

The comments also maintained that all the costs of schedule adjustment will be recovered from customers through the activity's pricing formula and specifically disputed our contention that a part of the interest costs would not be recovered. To the extent the interest rate used in the schedule adjustment formula is below Treasury's true borrowing costs, unrecovered costs will result to the Government.

Concerning the deferrals of accounts receivable, the comments objected to our presentation as misleading. They stated that although the deferrals were permitted, they were not the result of precipitous decisionmaking nor were they accomplished in a manner that amounted to subsidies to the customers. They also pointed out that interest was charged on the delinquent accounts at the rate then authorized by DOE. In the cases of customers A and D, they said the deferrals were permitted after the customers represented that they could not pay on time, and the deferral simply consisted of DOE's agreement not to terminate the contract. This agreement, they said, resulted in the maintenance of good customer relations, while fully

protecting the Government's interest. In the case of customer B, they acknowledged that the deferral resulted from a mistake, but the customer in that case never accepted delivery or obtained any benefit from it. Customer C was (and still is) facing serious financial difficulty as a result of the Three Mile Island accident.

Our purpose in this discussion, once again, was not to question the decisions themselves--in retrospect it appears that the deferral granted customer C, at least, was justified. Our objection was to the lack of financial analysis performed before the decision was made. We agree that the uranium enrichment officials were not responsible for the low interest rates charged, at the time, on delinquent accounts. Those rates were the subject of a prior IG report, and have since been raised.

Although the Assistant Secretary, as indicated, disagreed with many of the points in our first finding, he did concur in our basic recommendation and has directed that, in the future, all major enrichment decision documents specifically address financial considerations.

Concerning the use of the current-value-of-funds rate to calculate future schedule adjustment charges, the Assistant Secretary stated that the average-marketable-securities rate has consistently been used to represent the Government's cost of

funds for all purposes of uranium enrichment operations. He pointed out that the enrichment services contracts now require that the interest rate used on schedule adjustment charges be the same as that paid to customers on their advanced payments. He concluded that the average-marketable-securities rate, therefore, was the appropriate rate to use and should be continued. We believe it is more important, from the standpoint of full cost recovery, that the interest rates used reflect the Government's actual borrowing costs, which in this instance are represented by the current-value-of-funds rate. We are currently conducting a review of the interest rates used generally in enrichment pricing, and will address the interest rates used for advance payments and for pricing in that review.

Finally, the Assistant Secretary disagreed with our third recommendation that he consider reducing the 30-day payment period in future uranium enrichment contracts. He questioned the benefit to the Government since interest is now imputed on receivables and thus passed on to all customers. He also thought the change would have a negative effect on the activity's competitive position. Since the rate used to impute interest on the receivables is below the Government's borrowing costs, it does not fully recover the carrying costs of these accounts; and passing on those interest costs to all customers equally

through pricing is not really an equitable arrangement. It would be difficult to assess what, if any, effect a change in the billing cycle would have on the activity's competitive position. We believe, however, the effect would be minor in relationship to the many more important factors weighed in deciding on enrichment sources.

APPENDIX A

COMPARISON OF SCHEDULE ADJUSTMENT CHARGES (SAC's) CALCULATED BY THE INSPECTOR GENERAL'S OFFICE (IG) TO OAK RIDGE OPERATIONS SAC CHARGES

Customers	IG Calculated SAC Charges	DOE SAC Charges	Uncollected Difference
1.	$ 57,726,651	$ 6,678,169	$ 51,048,482
2.	133,007,470	12,215,789	120,791,681
3.	2,620,469	2,518,758	101,711
4.	2,150,189	2,066,731	83,458
5.	9,402,624	9,037,670	364,954
6.	6,166,522	5,927,175	239,347
7.	7,152,486	614,131	6,538,355
8.	6,097,014	5,860,364	236,650
9.	8,925,526	716,975	8,208,551
10.	17,140,895	3,088,777	14,052,118
11.	37,425,131	608,104	36,817,027
12.	2,237,061	2,150,232	86,829
13.	991,683	953,192	38,491
14.	11,599,157	2,674,297	8,924,860
Total Foreign	$302,642,878	$ 55,110,364	$247,532,514

Customers	IG Calculated SAC Charges	DOE SAC Charge	Uncollected Difference
15.	$ 22,470,086	$ 3,460,840	$ 19,009,246
16.	54,723,440	7,671,825	47,051,615
17.	43,614,676	8,275,903	35,338,773
18.	20,856,486	2,216,556	18,639,930
19.	16,598,340	1,938,181	14,660,158
20.	23,390,319	4,635,923	18,754,396
21.	30,122,358	3,737,289	26,385,069
22.	21,031,798	1,447,646	19,584,152
23.	10,043,748	1,864,023	8,179,725
24.	84,527,315	18,191,154	66,336,161
25.	18,912,858	5,622,133	13,290,725
26.	9,208,502	1,324,516	7,883,986
27.	19,874,962	4,719,258	15,155,704
28.	6,300,061	679,603	5,620,458
29.	5,875,428	513,409	5,362,020
30.	12,894,736	2,492,420	10,402,316
31.	24,356,102	2,699,869	21,656,233
32.	19,543,173	3,770,403	15,772,770
33.	10,634,361	2,242,387	8,391,974
34.	30,316,247	4,165,801	26,150,446
35.	3,108,843	917,888	2,190,955
Page Total	$488,403,839	$82,587,027	$405,816,812

Customers	IG Calculated SAC Charges	DOE SAC Charges	Uncollected Difference
36.	4,166,931	851,518	3,315,413
37.	13,448,078	2,034,950	11,413,128
38.	8,919,942	1,604,956	7,314,986
39.	7,166,013	793,165	6,372,848
40.	3,769,044	609,939	3,159,105
41.	6,837,824	568,811	6,269,013
42.	20,868,868	4,146,029	16,722,839
43.	53,255,019	5,989,718	47,265,301
Page Total	118,431,719	16,599,086	101,832,633
Total American	606,835,558	99,186,113	507,649,445
Total Foreign and American	$909,478,436	$154,296,477	$755,181,959

36.				
37.			$ 3,460,840	$ 19,009,246
38.				47,061,615
39.				14,338,773
40.				18,630,930
41.				16,660,150
42.				15,754,396
43.				26,185,069
				19,584,152
				8,179,725
				66,336,161
				15,[illegible]
26.			1,324,516	7,683,986
27.			4,719,268	15,155,704
28.			[illegible]	5,620,468
29.			[illegible]	5,362,020
30.			2,492,480	10,409,216
31.			2,619,966	21,558,233
32.			3,770,405	16,772,770
33.			2,242,387	8,791,974
34.			1,165,901	26,150,448
35.			[illegible]	2,190,965
Page Total			[illegible]	[illegible]

SCHEDULE ADJUSTMENT CHARGE FORMULA

The formula used to calculate schedule adjustment charges (SAC) is: units of deferred enriched uranium x price x net discount factor = SAC. This formula is based on the theory of discounting.

The formula for discounting is:

Present value = future value x discount factor

* The future value = price x quantity
* The discount factor = $(1/1+i)^{n}$ where "i" represents the cost of capital as a rate of interest and "n" represents the discounting period in years.
* Discounting is the process of finding the present value of a series of future cash flows. Present value represents the value today of a future payment, or stream of payments discounted at the appropriate discount rate. The discount rate is the interest rate used to represent the cost of capital.

In order to calculate the SAC, we first determined the present value of expected revenues in a given year. Then we determined the present value of those same revenues deferred to a later year. The difference between the two present values is equal to the SAC.

Example:

Initial Delivery Schedule	Units of Enriched Uranium	X	IG Projected Price	=	Projected Revenues
1980	106,209		$ 98.95 1/		$10,509,380.55
1981	98,261		113.70		11,172,275.70
1982	105,117		130.66		13,734,587.22
1983	92,072		150.14		13,823,690.08
1984	106,334		172.52		18,344,741.68

1/ Actual Price

These revenues were deferred one year. The cost of capital was 11.3 percent as of September 1979 (date the contract was signed). The present date was July of 1978.

(1) Calculate the net discount rate as $(1/1+i)^{n} - (1/1+i)^{n2}$ where "i" represents the cost of capital, "n" equals the years between the initial delivery date, and the present date and "n2" the years between the deferred date and the present date.

Initial Schedule	Net Discount Rate (%)	X	Projected Revenue	=	Schedule Adjustment Charge
1980	9.62		$10,509,380.55		$1,011,002.40
1981	8.64		11,172,275.70		965,284.62
1982	7.77		13,734,587.22		1,067,177.43
1983	7.00		13,823,690.08		967,658.31
1984	6.27		18,344,741.68		1,150,215.30
				TOTAL	$5,161,338.06

ASSUMPTIONS USED IN CALCULATING INTEREST COSTS TO THE GOVERNMENT AS A RESULT OF UNDER-COLLECTING SCHEDULE ADJUSTMENT CHARGES

According to Uranium Enrichment Services Activity (UESA) Pricing Policy, the $755 million in schedule adjustment charge undercollections, plus interest at the average-marketable-securities rate, will be recovered over a ten-year period. If these charges had been collected along with the other charges in Fiscal Year 1980, Treasury could have avoided borrowing $755 million plus interest at the current-value-of-funds rate. The undercollections will result in Treasury incurring additional interest costs of $270 million over the ten-year period. The assumptions and calculations follow:

ASSUMPTIONS

(1) $755 million will be collected evenly over a ten-year period. Therefore, $377.5 million ($755 - 2) will be outstanding for the full ten years.

(2) The interest rates will be based on the average rates in effect when the schedule adjustment charges were calculated at September 30, 1979:

(a) Average-marketable-securities rate of 8.202 percent

(b) Current-value-of-funds rate of 11.3 percent

FORMULA:

Compound value of $1: $Pn = Po\ (1+i)^n$ where
Po = beginning amount
Pn = ending amount
i = interest rates of 8.202 or 11.3
n = period covered

Using this formula, the future value of $377.5 million was calculated for Treasury at 11.3 percent and for UESA at 8.2 percent with the following results:

Treasury's ending amount:	$1,101,206,077
UESA's ending amount:	830,213,065
	$ 270,993,012